

# TERRESTRIAL PROSTIGMATIC MITES FROM JAPAN (I)

Some New Species of Eupodidae and Rhagidiidae

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## *Linopodes pubescens* n. sp. (Figs. 1 and 2B)

Female. Body  $774\mu$  long and  $440\mu$  broad in the broadest part, pear-shaped with the broad end to the rear; the transverse suture between propodosoma and hysterosoma not developed. White or yellowish white in colour. Hysterosoma dorsally with white and large T-form area of a secretory organ. Integument soft and smooth, densely with minute sculptures under the cuticular; weakly haired and the hairs are  $20-40\mu$  long and finely pinnated or simple setae. Rostrum  $146\mu$  long and  $60\mu$  broad and bifurcated in the tip; chelicera  $135\mu$  long and  $25\mu$  broad and with minute fingers. Pulpi normal,  $250\mu$  long and have four movable segments, the first segment  $39\mu$ , the second  $85\mu$ , the third  $77\mu$  long, the fourth  $53\mu$  long and  $13\mu$  broad, the distal half of the last segment narrowing abruptly knife-like or conical shaped, with 6-7 finely pinnated setae on it. Propodosoma rotundate and broad, epivertex also rotundate, provided with a pair of short ( $40\mu$ ) interior vertical setae; Exterior vertical setae  $27\mu$  long. Eye-spot hardly visible in the preparation; 2 pairs of shoulder setae are situated between the small eyes approaching each other on both sides, the inner pair of sensory setae on pseudostigmata weakly differentiated and no more than  $60\mu$  long. Hysterosoma elliptic, dorsally with 6 pairs, hind margin with 3 pairs of short setae; ventral setae long and pointed, epimerons with 2-3 setae, genital plates finely sculptured and with 6 pairs, the surroundings with 7 pairs of pinnate setae. With two pairs of genital suckers. All the legs are longer than the body length and the first  $3012\mu$ , the second  $1006\mu$ , the third  $909\mu$ , the fourth  $945\mu$  long; the first is abnormally long and 3.9 times as long as the body length, metatarsus the longest and  $1060\mu$  long, following basitarsus  $880\mu$ , tibia  $536\mu$  and telotarsus  $328\mu$  long, the last one with hooked lobes is easily flexible; patella  $82\mu$ , and trochanter  $79\mu$  long; empodium and claws are reduced in the first legs, but smaller as they are, in other legs are developed; tarsi also bears 4-5 pinnate setae besides the two claws and a haired

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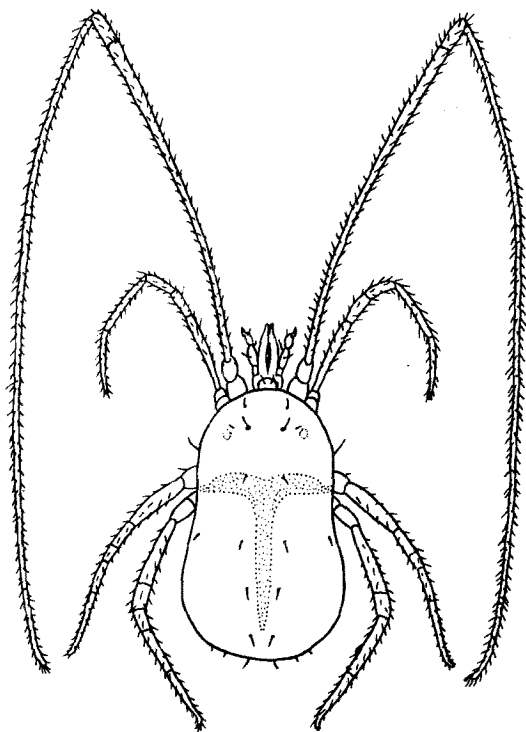


Fig. 1. *Linopodes pubescens* n. sp. female.

empodium ; the fourth legs are somewhat thicker than the other legs. The pregnant female usually bears 4-10 eggs.

Common species under the fallen-leaves in the forest. Fast moving and extremely fragile.

Male. 730 $\mu$ . Smaller than female and generally similar to that sex. The first legs total 3050 $\mu$  long and 4.2 times as long as body length, the first segment 74 $\mu$ , the second 968  $\mu$ , the third 53  $\mu$ , the fourth 602  $\mu$ , the fifth 1025  $\mu$  and the sixth 220  $\mu$  long.

*Holotype*, female, Shiroyama, Matsuyama City, Ehime Pref., 25-V-1962, K. Morikawa leg.

*Allotype*, male, same data as holotype.

*Paratype*, 5 females, same data as holotype.

Remarks : The present new species is similar to *L. motatorius* L., but in the

first legs of the former telotarsus is not so long and metatarsus is the longest and following basifemur and tibia, in that of the latter basifemur is the longest and telotarsus is next long. The new species is clearly larger than *L. motorius* and short-haired.

***Linopodes pubescens iwatensis* n. subsp.**

The body  $522\mu$  long and  $312\mu$  broad in the broadest part. Eye-spot clearly. Sensory setae situated between the eyes are comparatively long and  $115\mu$ . The first legs  $2300\mu$  long and 4.4 times as long as the body length, trochanter  $74\mu$ , basifemur  $656\mu$ , patella  $82\mu$ , tibia  $417\mu$ , metatarsus  $790\mu$ , telotarsus  $208\mu$  long. Palps total  $200\mu$  long, the first segment  $27\mu$ , the second  $69\mu$ , the third  $58\mu$ , the fourth  $48\mu$  long. Rostrum  $146\mu$  long and  $67\mu$  broad. The two hairs on the epivertex  $30\mu$  long.

*Type*, male, Uchimagi, Yamagata-mura, Iwate Pref., 7-VIII-1962, K. Morikawa leg.

***Rhagidia japonica* n. sp.** (Figs. 2B, 3, 4A and 5)

Female. Body oblongo-elliptic,  $1040\mu$  long and  $402\mu$  broad; the hind part of abdomen somewhat depressed; whitish in colour. Maxillae  $107\mu$  long and  $119\mu$  broad, bifurcated at the tip. Chelicera  $209\mu$  long, the tip of the fixed finger also bifurcated and dorsally with two hairs, the dorsal line of the chelicera fairly

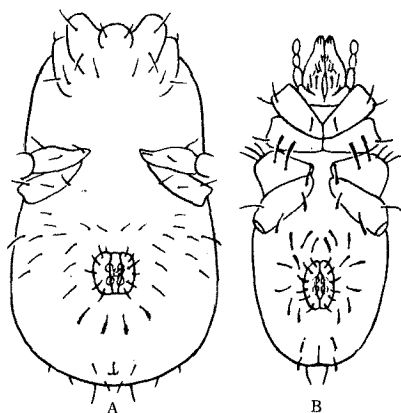


Fig. 2. A : Ventral view of *L. pubescens* n. sp. female.

B : Ventral view of *Rhagidia japonica* n. sp. female.

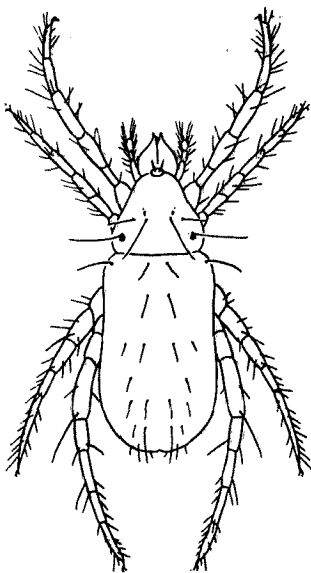


Fig. 3. *Rhagidia japonica* n. sp. female.

concaved, the movable finger slender, curved gradually and pointed, not obviously but certainly with two minute teeth on the inner edge (Fig. 4A). Palpus slender, the total length about  $160\mu$  long, the second segment the longest and  $97\mu$ , the third  $60\mu$ , the fourth  $80\mu$  long and with about ten, finely pinnated setae. Propodosoma is short ( $268\mu$ ) and about  $1/4$  of the body length; epivertex provided with 2 short setae. A pair of long sensory setae on the pseudostigmata situated between the short metopic setae (exterior vertical setae), also with one long seta on each eye-spot. Hysterosoma with a pair of shoulder hair, and dorsomedially with 5 pairs of setae in double column and on the hind part of the body with 4 pairs of setae on either sides of the above described column. Ventral side with oblongo-triangular and finely pinnated setae. Genital plates respectively with 6 pairs and anal surroundings with 2 pairs of those setae. The first epimeron with 2, the second with 1, the third with 3, the fourth with 2 and maxilla with 1 oblongo-triangular setae on each sides, the third epimeron anterio-laterally with 3 pairs of usual pinnate setae besides the three oblongo-triangular setae. The legs relatively long and narrow, almost as long as the body length and with plenty of the pinnate setae, the pedicered 2 claws each with small accessory teeth at the

base and minute teeth along the underside of the total length of the claws. Empodium haired and linguli-form. Sensory organs of the tarsus (Fig. 5, Rhagidia organ) : the tarsal segment of the first legs with 4, that of the second with 3 sensory pits, each of which obliquely situated and having a squamose setae ; tactile organ on the tarsal segment of the first legs located between the first and second proximal pits ; on the tarsi of the second legs, one lanceolate sensory hair situated at the hind of the last sensory pit ; the extremities of each tarsal segments without any special tactile setae. The total length of the first legs is  $1146\mu$ , and the trochanter  $119\mu$ , femur  $342\mu$  (basifemur  $225\mu$ , patella  $142\mu$ ), tibia  $283\mu$ , metatarsus  $208\mu$ , telotarsus  $194\mu$ . The total length of the second legs is  $953\mu$ , trochanter  $104\mu$ , femur  $268\mu$  (basifemur  $192\mu$ , patella  $113\mu$ ), tibia  $194\mu$ , metatarsus  $164\mu$ , telotarsus  $223\mu$  ; the total length of the third legs is  $911\mu$ , and trochanter  $104\mu$  (basifemur  $149\mu$ , patella  $141\mu$ ), tibia  $164\mu$ , metatarsus  $129\mu$ , telotarsus  $261\mu$  ; the total length of the forth legs in  $1326\mu$ , and trochanter  $126\mu$ , femur  $417\mu$  (basifemur  $253\mu$ , patella  $164\mu$ ), tibia  $231\mu$ , metatarsus  $261\mu$ , telotarsus  $342\mu$ . With two pairs of genital suckers ; usually bears 4-8 eggs ; genital taster lanceolate, with 8 pairs of characteristic setae on the both sides.

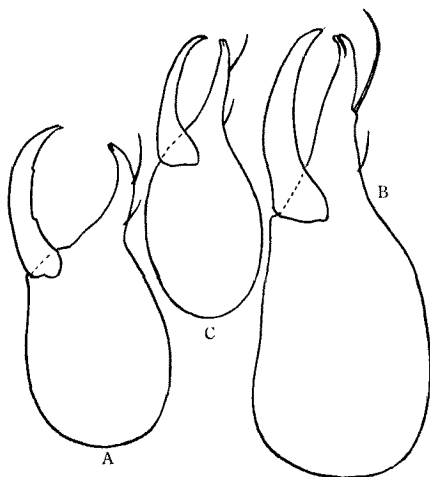


Fig. 4. Chelicerae of *Rhagidia*-species of Japan.

- A : *R. japonica* n. sp. (female) from Mt. Saraga-mine, Ehime Pref.  
 B : *R. uenoi* n. sp. (female) from Iwayano-ana Cave, Okayama Pref.  
 C : *R. uenoi* n. sp. (nymph) from Taniyamano-komori-ana Cave, Shiga Pref.

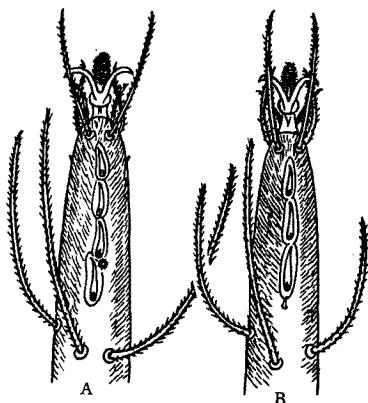


Fig. 5. Tarsus I (A) and II (B)  
of *R. japonica* n. sp. showing Rhagidia organ.

Common species in the moist places under fallen-leaves and bark of trees. Light-sensitive and fast-moving mites.

Male. Smaller than female and very similar to that sex, their differences are found in the presence or absence of the seminal vesicle.

*Holotype*, female Mt. Saraga-mine (1000 m. high), Ehime Pref., Shikoku, 24-VI-1952, M. Shiba leg.

*Allotype*, male, same data as holotype.

*Paratype*, 6 females and 2 males, Shiroyama, Matsuyama City, Ehime Pref., 21-VII-1962, K. Morikawa leg. 6 young females, Sugitate, Matsuyama City, 14-IV-1954, K. Morikawa leg. 3 females, Mt. Saraga-mine (1000 m. height). Ehime Pref., V-1954, K. Morikawa leg. 1 nymph, Uchimagi, Yamagata-mura, Iwate Pref., 7-VIII-1962, K. Morikawa leg.

Remarks: The present new species resembles *R. hamata* (P. Kramer and Neuman, 1883) in point of the concaved dorsal line of the cheliceral finger (Fig. 4A), but it is clearly different in the comparative length of the chelicerae, the palpi and the legs.

***Rhagidia uenoi* n. sp.** (Figs. 4, B and C)

Cave-dwelling species and very similar to the free-living *R. japonica*, but the dorsal line of the cheliceral finger not concaved (Figs. 4, B and C), legs are com-

paratively long, and the setae on the body and appendages are all clearly long and robust (Table 1). The tibial and telofemoral setae of the first legs are thick and robust. Zigzag and fast moves under stones.

*Holotype*, female, Gansuijino-ana Cave, North-east of Lake Hamana-ko, Shizuoka Pref., 16-III-1954, S. Uéno leg.

*Paratype*, one female the same data as holotype.

Records : 3 females, Anano-O Pot-Hole, Samegai, Shiga Pref., 3-V-1958, S. Uéno leg. 1 nymph, Taniyamano-Komoriana Cave, Samegai, Maibara-cho, Shiga Pref., 12-XI-1956, S. Uéno and N. Kobayashi leg. 1 female, Iwayano-ana Cave, Hokubo-cho, Okayama Pref., 15-VIII-1956, S. Uéno leg. 2 female Makino-ana Cave, Niimi City, Okayama Pref., 16-VIII-1955, S. Uéno and K. Morikawa leg. 2 females, 1

Table 1. Measurements of *Rhagidia*-species of Japan.

Measured parts		body l.	cheli-ceral l.	1st leg (l.)							1st leg l. / body l.	sex
Collected places (month)				troch- anter	basi- femur	pate- lla	tibia	basi- tarsus	telo- tarsus	total		
<i>R. japonica</i>	Sarage-mine (VI)	1.04	0.25	1.12	0.23	0.14	0.28	0.21	0.19	1.15	1.1	p ♀
	" (V)	0.73	0.24	0.08	0.20		0.19	0.13	0.13	0.73	1.0	p ♀
	Sugitate (IV)	0.91	0.26	0.09	0.35		0.29	0.22	0.21	1.16	1.2	p ♀
	" (IV)	0.90	0.25	0.07	0.34		0.27	0.22	0.20	1.10	1.2	p ♀
	Uchimagi (VIII)	0.63	0.18	0.06	0.19		0.15	0.11	0.13	0.65	1.0	n
<i>R. ueno</i>	Gansuiji-ana (III)	0.87	0.20	0.08	0.31		0.22	0.16	0.22	0.99	1.1	♀
	Anano-O P-Hole (V)	1.27	0.32	0.11	0.37	0.25	0.42	0.30	0.40	1.85	1.5	p ♀
	Taniyama K-ana (XI)	0.80	0.20	0.11	0.16		0.23	0.16	0.18	0.84	1.0	n
	Komori-ana (VIII)	1.04	0.31	0.15	0.29	0.22	0.42	0.25	0.30	1.62	1.5	♀
	Makino-ana (VIII)	0.80	0.30	0.13	0.32	0.18	0.42	0.25	0.31	1.61	2.0	♀
	Iwayano-ana (VIII)	1.05	0.35	0.12	0.31	0.22	0.46	0.27	0.33	1.73	1.7	♀
	Onigausu-do (III)	1.00	0.22	0.09	0.35		0.29	0.20	0.26	1.19	1.2	p ♀
	" (III)	0.73	0.22	0.09	0.33		0.25	0.18	0.25	1.10	1.5	p ♀
	Shubu-do (IV)	0.80	0.33	0.13	0.31	0.24	0.42	0.25	0.31	1.97	2.5	♀
	Karyu-do (III)	0.80	0.27	0.11	0.33	0.18	0.34	0.25	0.24	1.45	1.8	♀

l. = length, p = pregnant, n = nymph.

nymph, Komori-ana Cave, Niimi City, Okayama Pref., 15-VIII-1955, S. Uéno leg. 1 deutonymph, Taishodo Cave, Akago, Mito-cho, Yamaguchi Pref., 23-XI-1956, S. Uéno and G. Imadate leg. 3 females, Onigausu Cave, Kamiukena-gun, Ehime Pref., 28-III-1959, K. Morikawa leg. Many species, Rakan-ana Cave, Oda-cho, Ehime Pref., 6-I-1961, K. Morikawa leg. Many species, Kuroiwa-do Cave, Mikawa-mura, Ehime Pref., 15-IV-1956, K. Morikawa leg. 1 female, Shobu-do Cave, Tosayama-mura, Kochi Pref., 8-IV-1956, S. Uéno leg. 2 females, Karyu-do Cave, Oita Pref., 30-III-1957, S. Nomura leg.

All type specimens are deposited in our institute.

#### REFERENCES

- BAKER, E.W. and G.W. WHARTON (1952) An introduction to Acarology, New York, 465 pp.
- COOREMAN, J. (1961) Notes sur quelques acarions de la faune cavernicole (2<sup>me</sup> serie). Bull. Inst. Sci. nat. Belg. 35, (34) : 1-40.
- SCHUSTER, R. (1958) Neue terrestrische Milben aus dem mediterranen Litoral. Vie et Milieu, 9 : 88-109.
- THOR, S., and C. WILLMANN (1941) Acarina. Das Tierreich. Lfg. 71a : 1-186.
- WILLMANN, C. (1942) Milben aus deutschen Mineralquellen. Zool. Anz. Leipzig, 139, (11-12) : 237-247.
- ..... (1953) Tarsale Sinnesorgane bei der Gattung *Rhagidia* und anderen prostigamatischen Milben. Ibid. 150 : 215-223.
- ..... (1955) Milben aus dem südwestlichen Sachsen. Abh. Mus. Tierk. Dresden, 22 : 207-225.

## 摘 要

### 日本産土壌性中気門類のダニ (I)

#### ヒメハシリダニ科とハシリダニ科の数新種

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ここに新種として記載した *Linopodes pubescens* n. sp. テナガダニおよび *Rhagidia japonica* n. sp. ハシリダニは何れもぜい弱白色の小型のダニで、本邦各地の森林土壌にごく普通に見受けられる。*Linopodes* の方は第1脚が途方もなく長く、欧米でも long-legged mites とよび、所によってはキノコの害虫として問題になっており、植物を害するように見られている。本邦産のこの種は第1脚の節長や、体毛によって欧米の種と区別されるが、また東北産(岩手県)のテナガダニは関西のものに比べて小さく、擬気門の感覚毛が長いなどの差が認められ、その亜種として *L. pubescens iwatensis* n. subsp. トオホクテナガダニとよぶ。*Rhagidia* の方は樹皮下にも見られ、洞穴にもよく見出され、小昆虫やクモ・ダニおよびそれらの卵などを捕食し、落葉や石の間をジグザグに敏速に走りまわっているのがよく見受けられる。本邦のものは大顎固定指側の背線の湾入が目立ち、極北圏に知られる *R. hamata* に似た点もあるが、付属肢の比較長に大きな差があり、新種とされる。洞穴性のハシリダニは付属肢や毛が長く *R. uenoi* n. sp. ホラハシリダニとよび、静岡県以南各地の洞穴にかなり普通に発見されている。